Notes for WRCC Annual Conference
June 20, 2006
Hyatt Regency, Phoenix, Arizona
by Larry Dozier, Deputy General Manager, Central Arizona Project

Central Arizona Project is the largest single water supply provider in Arizona. We provide Colorado River water to the Central Arizona counties of Maricopa, Pinal, and Pima. Some parts of Central Arizona also use groundwater, other surface water, and effluent. The CAP "plumbing" can facilitate exchange with and deliveries of the Salt, Verde, Gila, and Agua Fria River supplies.

Water customers expect reliable, cost-effective delivery. Reliability is water in the right amount, in the right place, and at the right time. CAP has been doing that for the past 15 years or so. However, our system has not been stressed. We have only begun delivering our full available supply (1.5 to 1.6 maf) for the last few years and about one-third of that has been for underground storage.

How reliable can we expect the Colorado River supply to be? The Colorado River system has large storage reservoirs with lots of carryover each year. The river is over allocated; 16.5 maf allocated with an average annual supply of a little less than 15 maf, CAP is the major junior priority user - junior to all of California's basic use. The Colorado River is not yet overused because the Upper Basin has not yet fully developed. Shortages are not at all likely in the next five years and relatively low probability for the next 10 years. Any shortages in the next 20 years would only eliminate underground storage (banking) and agriculture use of CAP water. After 2040, shortages could occur 40 to 50 percent of the time.

Shortage criteria are expected to require shortage deliveries to be reduced to 1.0 to 1.2 maf per year to CAP. While this will require some banked water to meet the high priority use, about 1.15 maf. The Arizona Water Banking Authority and CAP will have sufficient water banked to restore full delivery for the long-term M&I subcontracts through 2100.

Municipal providers, Indians, and agricultural will not have the 300,000 to 500,000 af of non-Indian ag priority water available during shortages.

If we augment the Colorado River flows by 1.0 maf per year, there would be essentially no probability for shortages through 2100. That amount of augmentation or more could be accomplished with a combination of cloud seeding (weather modification), water shed vegetation management (Healthy Forests) and phreatophyte (Tamarisk and other non-natire species) management. Increasing water supply for critical uses can also be accomplished by reducing uses through land fallowing and system efficiency improvements. There are lots of ways to keep the Colorado River supply reliable but we must plan, establish funding, and implement some of those ways.

The more costly ways of augmentation would be introduction of new supplies to the Colorado River. Importation from other sources (icebergs, Great Lakes, Columbia River) is possible but not likely. Desalinization of brackish and ocean water is possible and will happen at some level. I will briefly describe two potential examples available for augmenting the Colorado River supply. There is an excess of brackish agricultural drainage water in the Yuma area. The Yuma Desalting Plant exists, but needs rehabilitation. 50,000 to 100,000 af per year of brackish water could be desalted and delivered directly or returned to the river for use allowing a like amount to be diverted upstream to CAP or Lake Havasu City or Mohave Valley. A large desalting plant, could be located along the coast of the Gulf of California in the Rocky Point – El Gulfo area. A Palo Verde size power plant and modular desalter with a capacity of 1.5 maf per year would provide power and clean water for local use and up to 1.5 maf per year could be delivered to the Colorado River at Imperial Dam near Yuma to replace part of the 6.0 maf per year that is delivered through that location. The up to 1.5 maf of replaced water could be taken through CAP or Metropolitan Water District of California or Las Vegas or maybe even Denver and Salt Lake City.

The cost of the YDP water would be less than $350 per af at the plant. The cost of the ocean desalinization might be $2,000 per af or more at Imperial Dam. Even if the costs are $3,000 per af, that is only $9 per 1,000 gallons. That level of cost would create monthly average water bills of $200 per month for a household. That is about like electricity or the combined telephone, television, and Internet bills. Is that too much to pay for reliable water delivery?

An augmented Colorado River supply requires infrastructure – CAP canal capacity – for delivery into Central Arizona. The CAP pumping plant at Lake Havasu (Mark Wilmer pumping plant) has a capacity of 3600 cfs. The tunnels and pipelines leading to Phoenix have a slightly higher capacity. The other pumping plants and the canal are 3100 to 3400 cfs. With reasonable due diligence, the pumping plants can be upgraded and the canal lining can be raised to attain the 3600 cfs capacity. At that capacity, the CAP system could deliver 2.0 to 2.1 maf per year at 80 to 85 percent load. That is a 15 to 20 percent reduction for scheduled maintenance and unscheduled outages or if there is no place to deliver the water. The additional capacity would allow an additional 500,000 af per year to be delivered from the Colorado River.

Summary and Conclusions

1. With reasonable good utility-type practices and management, the CAP can easily and reliably deliver the high priority M&I and Indian contract obligations through 2100.
2. With a little foresight, good planning, and nominal additional funding, the CAP can reliably deliver 1.5 maf per year.
3. With longer term planning, money for augmentation and enhancement of canal capacity, the CAP can reliably deliver 2.0 maf per year.
4. If we need more than 2.0 maf of water through the CAP, we will need substantial investment in infrastructure and large-scale augmentation programs.

The big picture is not too scary. The Draft Discussion Paper provided prior to this seminar noted in year 2100, population projections for Central Arizona at 15,200,000 and for the state 18,000,000. If we can accomplish a GPCD of 150, that is 6 people per acre-foot per year. That translates to about 2.5 maf of municipal and industrial needs in Central Arizona and 3.0 maf for the state. Arizona Department of Water Resources Director Guenther regularly shows us a state supply of 7.5 to 7.9 maf. That leaves a lot for agriculture and other uses. If CAP can deliver 1.5 to 2.0 maf, the SRP produces 1.0 maf or more along with the Gila River, the Agua Fria River, groundwater, and effluent there is more than 2.5 maf for Central Arizona.

The water supply is available. Can it be delivered in a reliable and cost-effective manner to the desired location at the desired time? Total water supply is not the growth limiter. The cost of getting some supplies to some places is or should be a factor in guiding growth.

G:\data\gm\dozier\06-20-06 WRCC Annual Conference notes LRD.doc